

on the outside of each ankle. It is a large Otter, nearly 5 feet long. The fur is beautifully soft, of a golden-brown hue, with a white streak on each side of the throat.

*Artificial Hybridization in the Genus Gossypium.*

By J. E. BALSAMO.

In the province of Terra d'Otranto, one of the most southern districts of Italy, the cotton-tree has been cultivated from time immemorial. The processes of cultivation there generally followed are well adapted to the nature of the plant, and in this particular there is nothing to be changed; but the species of cotton-tree are not so well selected; for although the short-stapled *Gossypium herbaceum* is not much cultivated, but more commonly the *G. hirsutum*, which is preferable as regards its textile qualities, this is far from having the length, fineness, softness, and lustre of the cotton of *Gossypium barbadense*, commonly known as Sea-island or long-staple cotton. During the American war I experimented upon many American varieties of cotton, particularly the Sea-island, New Orleans, and Louisiana, and I distributed a great part of the seed which I obtained among the cultivators of my province. The last two of these varieties, which, from some of their characters, may be referred to the Siamese type, prospered; the Sea-island, which is less hardy and ripens later, did not succeed. Most of its capsules open in the months of September and October; and the rains of autumn spoil its fibre. It then occurred to me to unite the two types with long and short staples, in the hope of obtaining a variety of cotton which should combine the precocity and hardness of the Louisiana or Siamese with the length, fineness, and silky lustre of the Sea-island cotton. The six hybrids and mules which I present to the Academy, taken from among many others which I have obtained, are derived from the harvest of last summer, and are crossings of *Gossypium hirsutum* of the improved white Siamese variety, and of the variety with red or nankeen cotton, with *Gossypium barbadense*. I purposely selected the nankeen, because, as it is reddish, we may the better judge of the predominance of the red or white type of the parents by the different shades of the hybrid cottons. This is the most striking character for those who are not accustomed to distinguish the organic, botanical, and physical differences of hybrid products.

Each species of cotton-tree has five petals and a great number of monadelphous stamens, all bearing anthers, and surrounding the pistil at different heights. They seem to be so many radii implanted obliquely upon the central cylinder or bundle formed by the styles. There are as many styles as stigmata, and they may easily be separated with the point of a penknife. They may be recognized by the naked eye in the form of three, four, or five delicate nervures, united together on the inside. The number of cells in each capsule invariably corresponds to that of the styles; it is therefore of importance to select the capsules which have the greatest number of cells, in order to obtain a greater number of tufts of cotton.

The oblique position and nearly radiating arrangement of the stamens renders artificial fecundation difficult, in consequence of the difficulty of cutting them all down to the bottom of the calyx and removing them without the falling of a little seminal dust upon the stigmata. Nevertheless I have succeeded in avoiding the contact of the anthers with the latter, and in transporting the pollen to the pistils of flowers from which I had removed all the stamina. I took the precaution of cultivating the species intended for mutual fecundation at a distance from each other, and of waiting for the moment of the escape of the pollen, which usually takes place about noon, when the flower opens. Hence the hottest hours of the day are those of the dehiscence of the stamina. During and after fecundation the petals close again, the stamina acquire a more vertical position, and the pistil lowers its stigmata towards the stamina which are beneath it; the corolla changes from yellow to rosy red, and on the following day it falls withered. If it happens to rain on the day of the flowering of the cotton-tree, the water which remains in the flower alters and blackens the pollen; in that case natural fecundation itself may fail, and the withered flower does not fall, or falls very late. Strong winds, by carrying off the greater part of the pollen, may also cause natural fecundation to be imperfect; in this case the capsule remains rudimentary, withers, and falls in a few days.

My six hybrid plants, obtained from the nankeen cotton-tree, fecundated by the pollen either of the Siamese cotton-tree or of *Gossypium barbadense*, and from *G. barbadense* fecundated by the pollen of the nankeen cotton-tree, show in the colour, softness, elasticity, and length of the fibre, in the nakedness of the seeds and the form of the leaves, their relation to the two types which produced them. It is as well to state that in the floral organs of these hybrids I have not observed any deformity or modification, except that the nervures of the style present a helicoidal deviation at the extremity.

Being engaged with cotton-trees, I wished to study the influence of light upon the germination of their seeds. I selected those of *Gossypium barbadense*, which are black, and more easily followed in the changes which they undergo during germination. I made use of a large glass vessel, into which I put a homogeneous vegetable soil. I introduced cotton-seeds at different depths, in such a manner that, being in contact with the inner wall of the vessel, I could see one side of them from without. A portion of these seeds were protected from the chemical rays of light by means of pieces of yellow paper pasted on the outside at the points corresponding to the seeds; the rest were left freely exposed to the light. The vessel was in the open air, and was watered every three days. This experiment was commenced on the 15th May; on the 24th the seeds covered by the paper began to show the radicle and the plumule, whilst those exposed to the light did not show the least sign of germination. The former thrived in their vegetation; the others, when taken out in ten days' time, appeared sensibly altered. It appears, therefore, that light is injurious to the germination of the cotton-tree.—*Comptes Rendus*, November 4, 1867, pp. 763-766.